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(19) **United States**(12) **Patent Application Publication**  
**Zollinger**(10) **Pub. No.: US 2011/0182942 A1**(43) **Pub. Date: Jul. 28, 2011**(54) **MENINGOCOCCAL MULTIVALENT NATIVE  
OUTER MEMBRANE VESICLE VACCINE,  
METHODS OF MAKING AND USE THEREOF**(76) Inventor: **Wendell David Zollinger**, Silver  
Spring, MD (US)(21) Appl. No.: **12/995,268**(22) PCT Filed: **Jun. 1, 2009**(86) PCT No.: **PCT/US09/45818**§ 371 (c)(1),  
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30, 2008.**Publication Classification**(51) **Int. Cl.****A61K 39/095** (2006.01)**C12N 1/21** (2006.01)**C12N 15/74** (2006.01)**A61P 31/04** (2006.01)**A61P 37/04** (2006.01)(52) **U.S. Cl. .... 424/235.1; 435/252.3; 435/471**(57) **ABSTRACT**

The present technology provides vaccine compositions comprising native outer membrane vesicles (NOMVs) from at least one genetically modified strain of *Neisseria* which provides protective immunity to meningococcal disease, more preferably subtype B meningococcal disease. The present technology further provides methods of immunizing an animal or human against meningococcal disease comprising administering the vaccine composition of the present invention.